Технические характеристики на

усилители измерения давления серии DMV 4000

Contents:

1. General Description:

The Gneuss pressure measurement amplifier type DMV 4000 is a measurement amplifier for pressure transducers with strain gauge technology. Universal setting possibilities guarantee that all pressure transducers with 1 to 4 mV output signal can be connected. Furthermore, three freely-adjustable limit contacts and one optional analogue signal 0-10 V, 0-20 mA or 4-20 mA can be processed. A peak hold function, simple operation via a touch sensitive keypad and extreme sturdiness guarantees a high ease of operation. The unit can be protected against unauthorized use via possible software settings.

2. Technical specifications:

Dimensions:	96 mm x 48 mm (1/8 DIN front housing) x 110 mm Incl. Terminal block with quick-lock function by means of plastic clamps, for wall thicknesses of up to 10 mm.
Colour:	Dark grey
Weight:	approx. 250 g
Panel cut- out size:	$92{,}0^{+0{,}8}$ x $45{,}0^{+0{,}6}$
IP rating:	From front IP 65, connection IP 00
Input:	Wheatstone resistance bridge 350 Ω....10 KΩ
Supply voltage:	5 VDC transducer supply
Sensitivity:	1 mV/V….4mV/V
Relay Contacts:	Up to 3, over the overall measuring span freely adjustable relays Switching capacity: 250 VAC = 2A / 120 VAC = 4A
Fail –Safe feature:	Performance control – Sensor connections
Accuracy:	+/- 0,1 % of measuring value, +/- 1Digit Ambient temperature influence <0.1 %/20 °C
Power supply:	Supply voltage 100…230 VAC +/- 10 %, 50 - 60 Hz. Power consumption approx. 4 W (optional 24 V DC)
Display:	5-digit seven segment LEDs, 15 mm high, luminous: green or red when exceeding a preset alarm parameter, indicating range -99999….99999, arithmetic overflow is indicated by 5 cross-ledgers
Connection of the Instrument:	On the reverse via a 36-pole terminal block
Ambient conditions:	Operating temperature 0-50 °C / humidity level 5….95 % (no condensation)
Analogue output:	0-20 mA or 4-20 mA at current load 750 Ω /15 V max. 0-10 V at 500 Ω resistance at 0-20 mA set parameter

3. Assembly:

The instrument is designed for panel assembly. It is to be assembled in such a manner, as to protect it from humidity, dirt and vibration. The ambient temperature is not to exceed 50 °C.

4. Commissioning electrical connection:

The instrument is only to be connected and operated by qualified personnel. Please see attached diagram for wiring connections. The local regulations for operating electrical factory equipment are to be stringently adhered to.

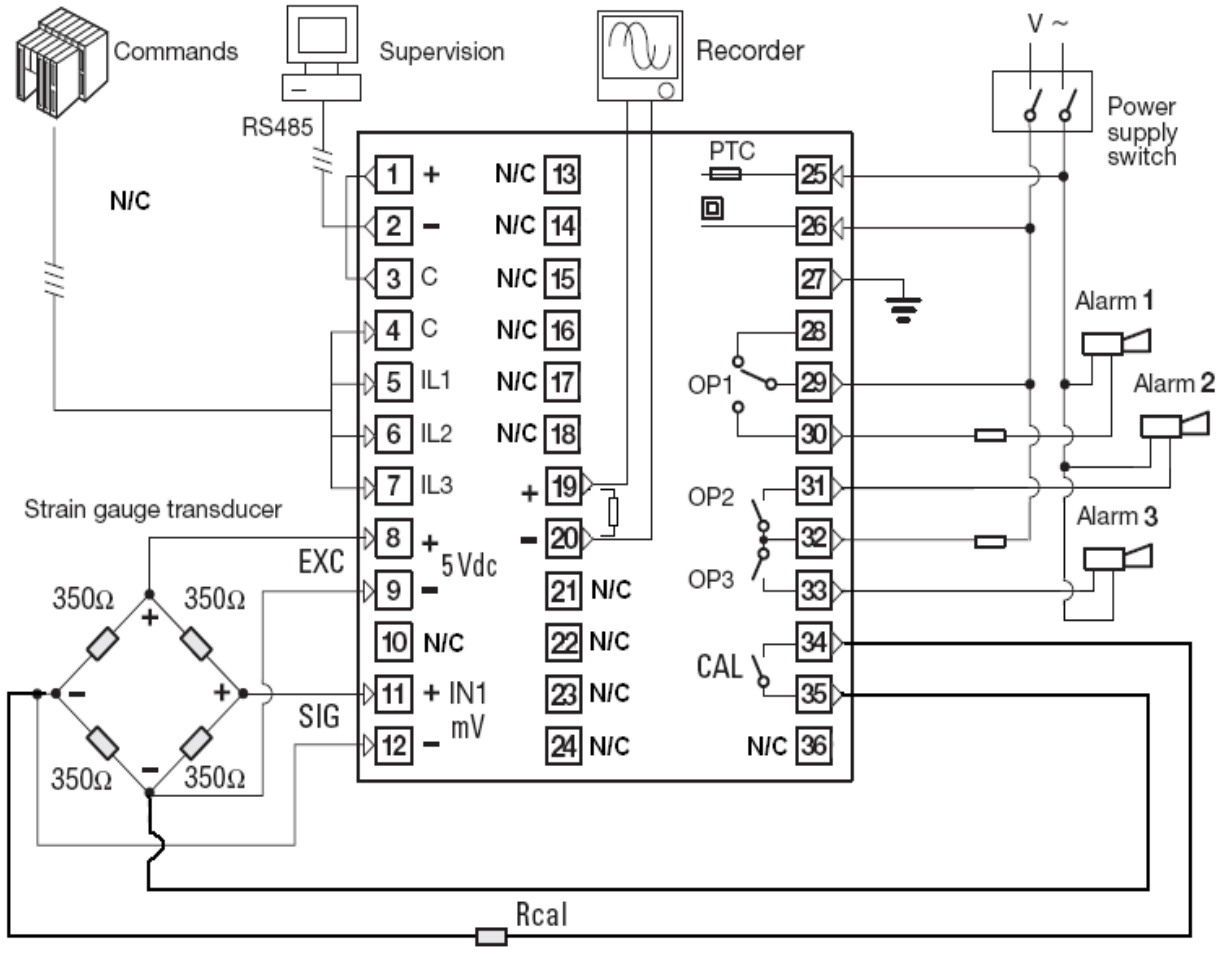
CE-Mark

For unrestricted operation of the instrument according to the guidelines of the electromagnetic compatibility 89/336/EEC all analogue wiring needs to be shielded. The shield is to be one sided

UL recommendation: 1) Use copper conductors designed for temperatures up to 60/70 °C
2) Minimum cross-section of 1mm² to be utilized. (AWG 18)

Analogue output:
For an analogue output of 0-10 V, the pre-installed 500Ω resistance is to be used with a set parameter of 0-20 mA. For all other outputs, the pre-installed 500Ω resistance has to be removed from terminals 19 / 20.

Wiring configuration:



Colour coding and termination of Gneuß extension cable			
Pressure sensor Pin	Colour (6P)	Function	DMV 4000 terminal
A	Yellow	Signal +	11
B	White	Signal -	12
C	Brown	Supply +	8
D	Green	Supply -	9
E	Pink	Cal. 80 %	34
F	Grey	Cal. 80 %	35

5. Adjustment possibilities:

The following table lists the possibilities of parameter changes

conF			Configuration menu	
PASS	Code I		Configuration menu password	Input Range
	bASE_c			
		FrEQ	Frequency of input voltage	50 / 60
	InP			
		Unit	Engineering units	Bar / PSI / Mpa
		dP	Number of decimals	0...3
		FILt	IN 1 filter constant time	0...30 s
		rAn_Lo	Low range	-9999...99999
		rAn_Hi	High range	-9999...99999
	AO			
		AO_tyP	Analogue Out Type	0-20 / 4-20
		AO_Lo	Analogue Out Low Range	-9999...99999
		AO_Hi	Analogue Out High Range	-9999...99999
	SyS			
		Prot	Communications protocol	Modbus / Jbus
		bAUd	Baud rate	200...57600
		PAry	Parity	none/euen/odd
		Addr	Communications address	1...247
		CodE1	Password 1	0...65534
		CodE2	Password 2	0...65534
		CodE3	Password 3	0...65534
	ALArm			
		AL1_Lt	Reset by acknowledgement or external (IL1)	none / Ltch
		AL2_Lt	Reset by acknowledgement or external (IL2)	none / Ltch
		AL3_Lt	Reset by acknowledgement or external (IL3)	none / Ltch
		Out 1	Output action of alarm 1	direct / reverse
		Out 2	Output action of alarm 2	direct / reverse
		Out 3	Output action of alarm 3	direct / reverse
	CAL			
		CAL_Pt	Shunt for strain gage cal.	50...100%
	Exit		Exit Configuration menu	

PAr			Parameter setting menu	
	PASS	Code 2	Parameter menu password	Input Range
		AL_ SP		
		AL_ 1SP	Alarm Setpoint 1	0...high range
		AL_2SP	Alarm Setpoint 2	0...high range
		AL_3SP	Alarm Setpoint 3	0...high range
		AL_PAr		
		AL_ 1hY	Alarm hysteresis 1	0...10.0 %
		AL_2hY	Alarm hysteresis 2	0...10.0 %
		AL_3hY	Alarm hysteresis 3	0...10.0 %
		AL_ 1 d	Alarm activation delay 1	0.0...60.0 s
		AL_ 2d	Alarm activation delay 2	0.0...60.0 s
		AL_3d	Alarm activation delay 3	0.0...60.0 s
		FILt		
		tI mE	Filter time constant	0...30.0 s
		Exit		Exit Parameter menu

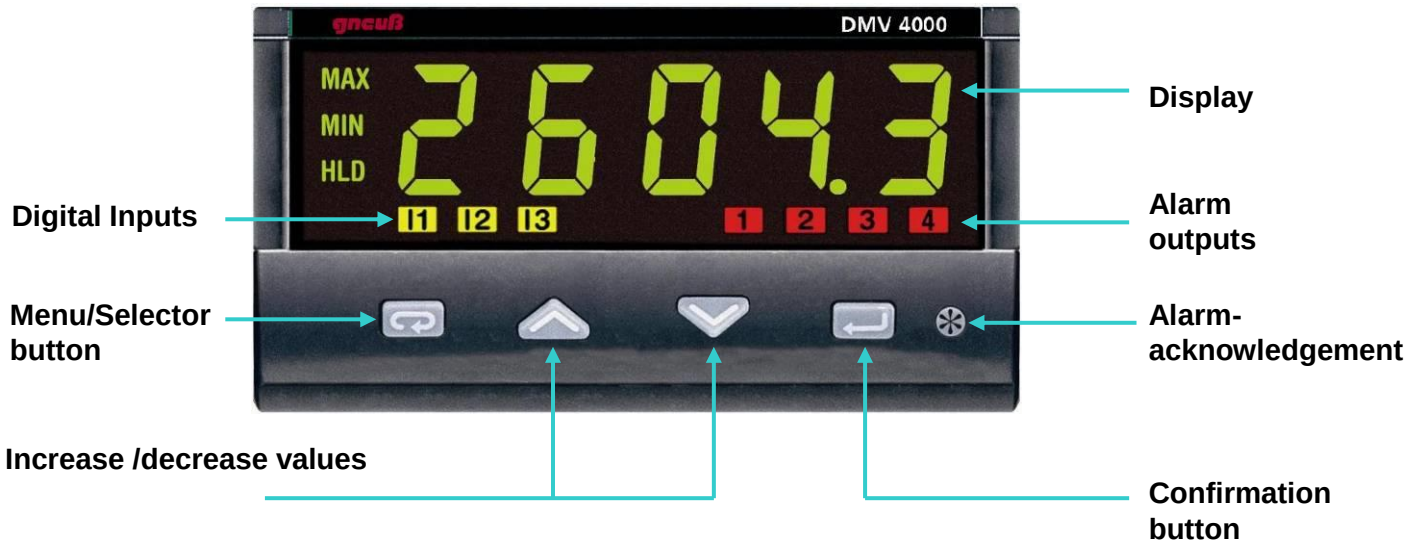
CAL			User calibration menu	
	PASS	Code 3	User calibration menu password	Input Range
		CAL		
		C-ALL	Zero + Span calibration (50….100%)	Yes / no
		C-H i	Only Span calibration (50….100%)	Yes / no
		Exit		Exit user calibration menu

Explanation of parameters:

A It_U		:	activate or deactivate the cycle of measuring units in operating mode.
PASS		:	Password input for appropriate level
bASE_c	=> FrEq	:	Adjusting the net frequency of the supply voltage. Choice between 50 or 60 Hz.
InP	=> Unit	:	Selection of measuring units between bar, psi und MPa.
	=> dP	:	Adjustment of the decimal indication, e.g. 0 = 123 or 3 = 123.937.
	=> FILt:	:	Delay time (seconds) between value variation and display variation
	=> rAn.Lo	:	Measuring value begin of sensor
	=> rAn.Hi	:	Measuring value end of sensor e.g. 500 at 500bar or 5000 at 5000 psi
AO	=> AO.tyP	:	Adjustment possibilities of analogue signal between 0 – 20 mA (0 – 10 V) or 4 – 20 mA. The 0 - 10V signal is achieved by connecting a 500 Ω resistor parallel to pins 19 and 20. **This resistor has to be removed for 0-20 mA or 4-20 mA.**
	=> AO.Lo	:	Adjusting the minimal analogue output signal
	=> AO.Hi	:	Adjusting the maximum analogue output signal
SyS	=> Prot:	:	Selection of communication protocol between Modbus or Jbus.
	=> bAUd:	:	Adjusting the Baud rate of communication e.g. 9600 = 9600 Baud.
	=> PAry:	:	Adjusting the parity
	=> Addr:	:	Adjusting the communication address
	=> CodE1	:	Adjusting the password for the configuration level (3333 factory setting)
	=> CodE2	:	Adjusting the password for the parameter level (1111 factory setting)
	=> CodE3	:	Adjusting the password fort the calibration level (1234 factory setting)
ALArM	=> AL 1.Lt	:	Choice of self-maintenance/latch feature for Alarm 1- active or non-active : active = Ltch and non active = nonE
	=> AL2.Lt	:	Choice of self-maintenance/latch feature for alarm 2 – active or non-active: active = Ltch and non active = nonE
	=> AL3.Lt	:	Choice of self-maintenance/latch feature for alarm 3 – active or non-active: active = Ltch and non active = nonE
	=> Out 1	:	Choice of alarm configuration of alarm 1 output signal Alarm contact is direct/closed (dir) or reverse/open (rEu)
	=> Out 2	:	Choice of alarm configuration of alarm 2 output signal. Alarm contacts is direct/closed (dir) or reverse/open (rEu)
	=> Out 3	:	Choice of alarm configuration of alarm 3 output signal Alarm contacts is direct/closed (dir) or reverse/open (rEu)
CAL	=> CA.LPt	:	Adjustment of sensor calibration shunt in % of measuring range
	=> Exit	:	Exit the configuration level, parameter level or the calibration level
AL.SP	=> AL. 1SP	:	Adjusting the alarm set-point for Alarm 1. e.g. 350 bar = 350 with 600 bar sensor
	=> AL.2SP	:	Adjusting the alarm set-point for alarm 2 . e.g. 450 bar = 450 with 600 bar sensor
	=> AL.3SP	:	Adjusting the alarm set-point for Alarm 3. e.g. 500 bar = 500 with 600 bar Sensor

AL_PAr	=> AL_ 1hY	:	Adjusting the hysteresis of the set-point of alarm 1 in % e.g. 10 (%) of 350 bar = 3,5 bar
	=> AL.2hY	:	Adjusting the hysteresis of the set-point of alarm 2 in %. e.g. 10 (%) of 450 bar = 4,5 bar
	=> AL.3hY	:	Adjusting the hysteresis of the set-point of alarm 3 in %. e.g. 10 (%) of 500 bar = 5 bar
	=> AL.1 d	:	Adjustment of time delay (Sec. trail) for Alarm 1
	=> AL.2 d	:	Adjustment of time delay (Sec. trail) for Alarm 2
	=> AL.3 d	:	Adjustment of time delay (Sec. trail) for Alarm 3
FILt	=> tI mE:	:	Time (seconds) to respond to alarm parameter change.
CAL	=> C-ALL	:	Calibration function with zero- and calibration point (50….100 %)
	=> C-H i:	:	Calibration function only of calibration point (50….100 %)

6. Display and operating elements:



Button functions and combinations:

Selects between calibration, parameter and configuration level. By selecting within the calibration, parameter and configuration levels sub-menus can be chosen

By activating in Programme mode the selected value is decreased
By activating in operating mode the MIN memory is evaluated and displayed

By activating in programme mode the selected value is increased
By activating in operating mode the MAX memory is evaluated and displayed

By activating within the calibration, parameter and configuration level all sub-menus are switched over and the changed values are stored.
By repeated activation in the operating mode the MIN-(), MAX-memory values or units are displayed and at A IE.U the cycle display of the measuring units is activated or alternatively deactivated.

By activation, the internal peak hold function MIN / MAX is deleted and updated.

7. Programme accessibility / barring:

7.1 Keypad lock/unlock

The DMV 4000 allows all accessibility levels to be password protected.

To lock/unlock the keypad, press and hold the keys  and  simultaneously for 2 seconds. With keypad locked, if the user presses a key, the instrument displays the message „Lock“.

The keypad lock is retained in the event of power failure.

7.2 Output lock/unlock

The analogue and alarm outputs are switched to the OFF status by pressing and holding the keys  and  simultaneously for 2 seconds. With the outputs locked, when displaying the process variables, the instrument displays the message “block” instead of “Unit”. To unlock the outputs press the keys simultaneously again.

The output lock is retained in the event of power failure.

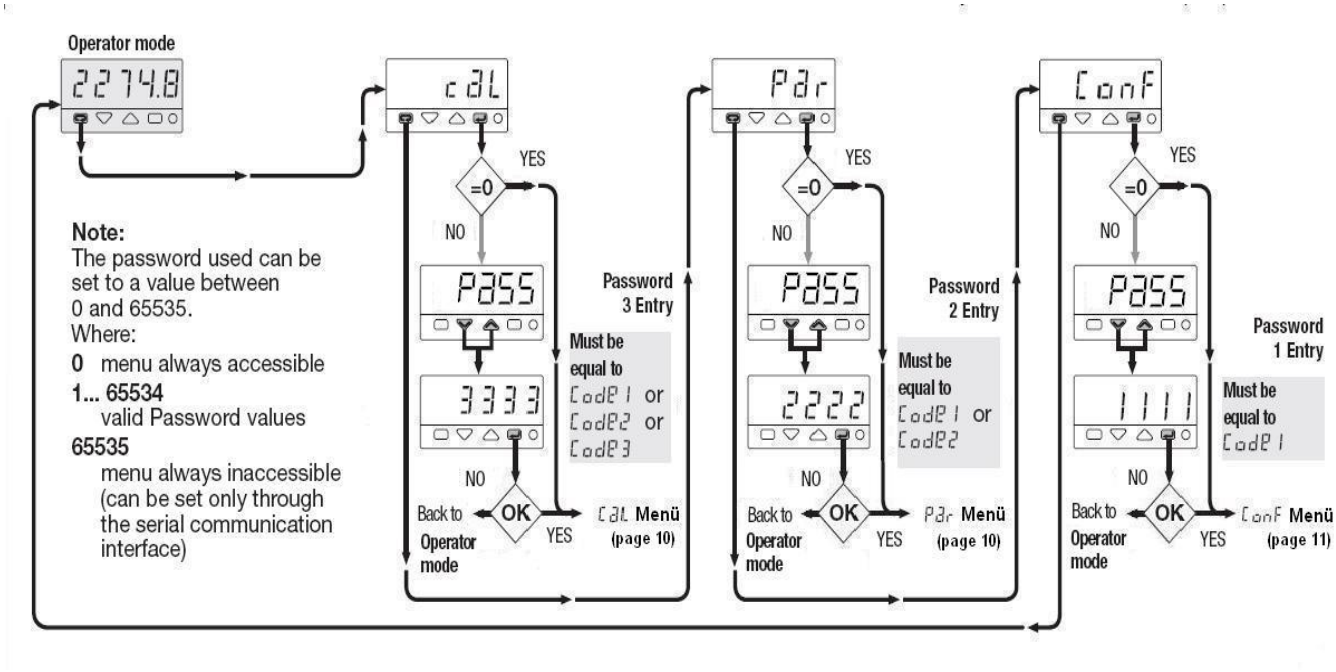
8. Commissioning

Listed below is a step-by-step breakdown for start-up and commissioning purposes. In order to warrant an exact measurement, the connected pressure sensor needs to be calibrated in conjunction with the DMV 4000. **During the calibration procedure, the pressure sensor must be at operating temperature and not subjected to any pressure influences.**

1. Confirm no supply voltage.
2. Connect DMV 4000 according to wiring diagram (page 4)
3. Connect supply voltage. After approx. 3 seconds the DMV 4000 is ready for operation.

Adjustment levels (see Tables on pages 5 and 6).

By repeatedly activating the button the DMV 4000 switches from operating mode to calibration mode alternatively to Parameter mode (Par) and to configuration mode (Conf). On pushing again the instrument is set back to operating mode.

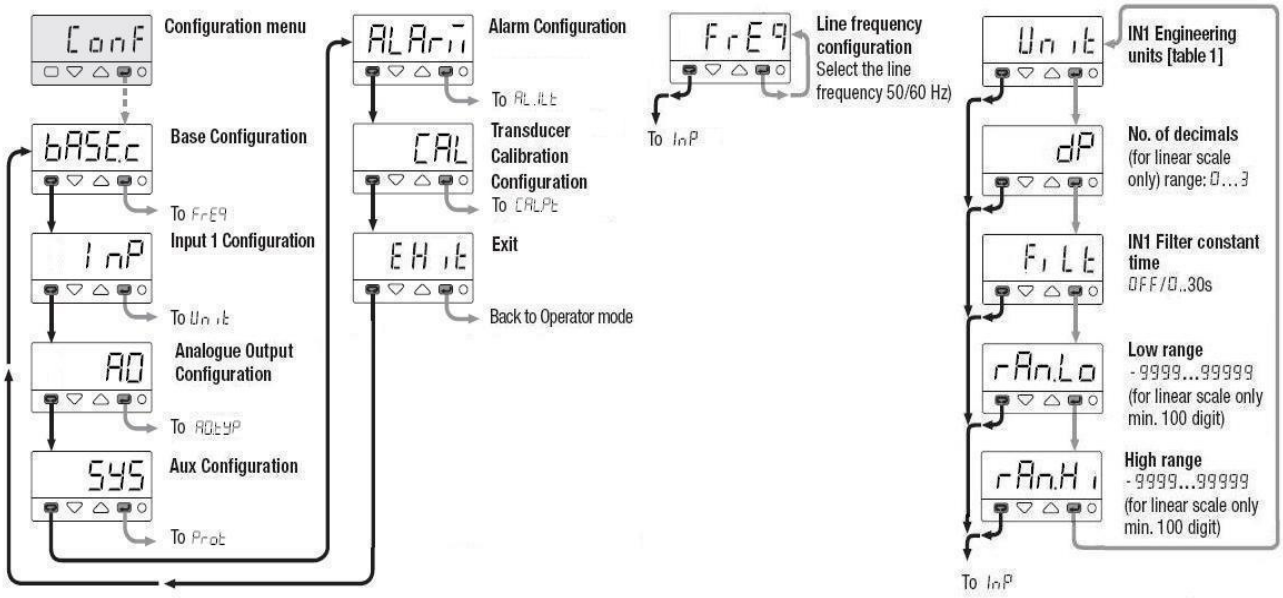


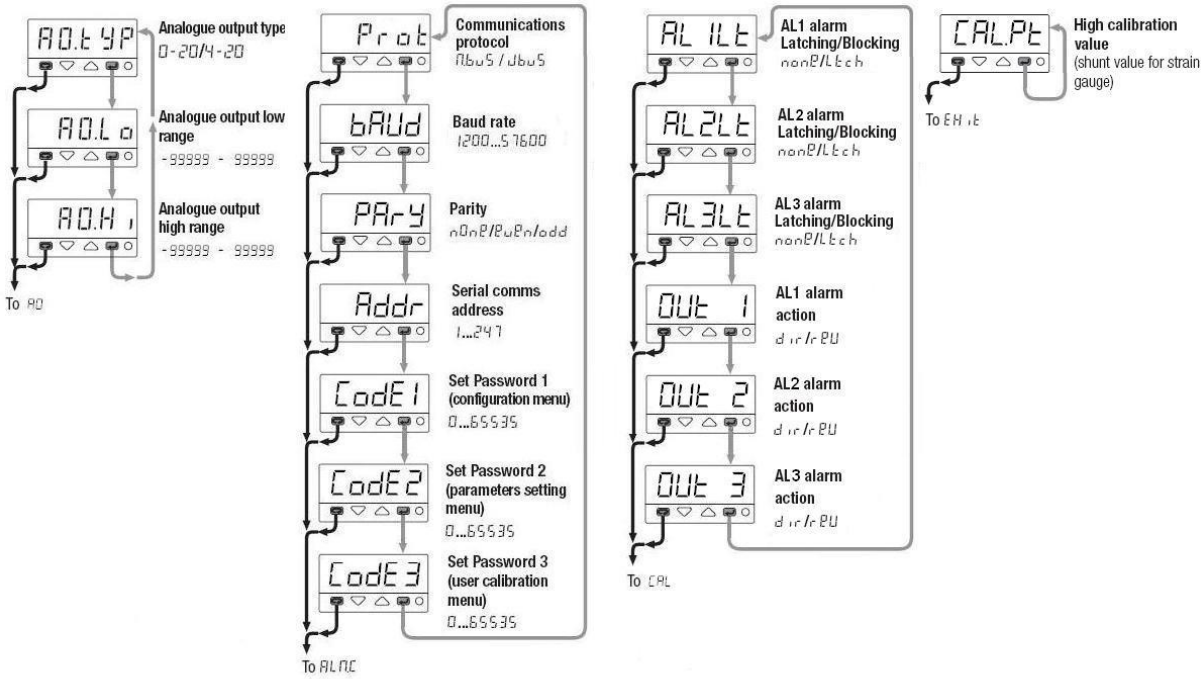
Factory setting of passwords see page 7!

To access all levels a password needs to be entered after pushing .This is done by holding down the buttons and the instrument automatically selects ones, tens, hundreds and thousands and selectably increases or decreases. By pushing the button the next accessible level is reached.

Configuration mode (ConF)

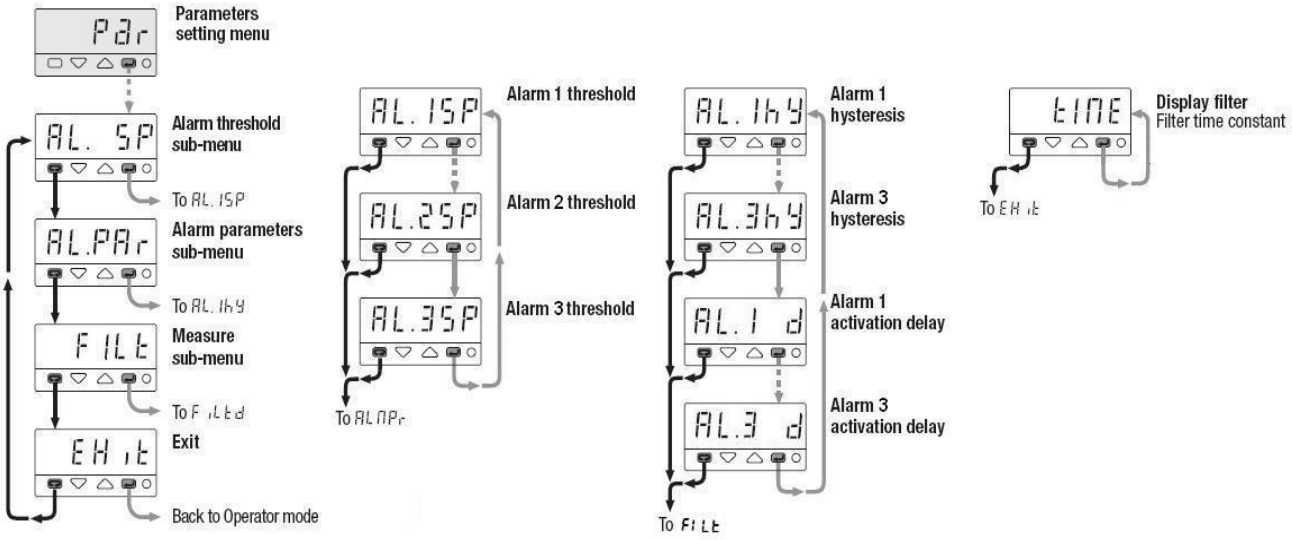
Is divided up as follows:
Basic configuration: Adjusting the supply frequency
Input configuration: Adjusting the measuring values, commas and input values
Configuration of analogue outputs: Adjusting the analogue output signals
System configuration: Adjusting the serial communication and passwords
Alarm configuration: Adjusting the Alarm outputs
Sensor calibration configuration: Adjusting the sensor calibration points





Parameter levels (PAR)

Is divided up as follows:
Alarm set-points: Adjusting the separate alarm contacts 1 - 3
Alarm parameter menu: Adjusting the hysteresis and delay times of alarms 1 - 3
Alarm reaction times: Adjusting the reaction times from 0 to 30 seconds



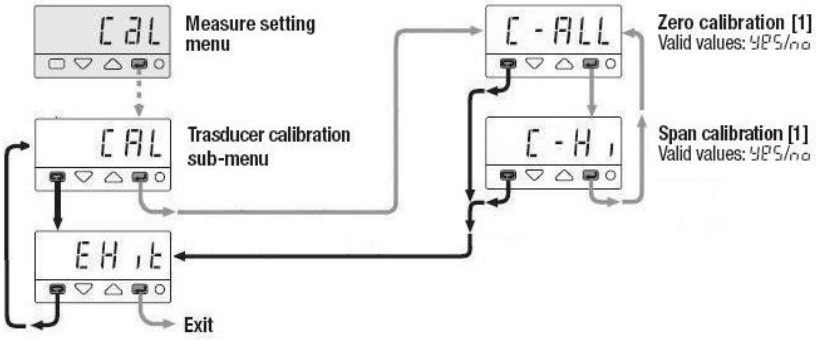
Calibration mode (CAL)

Is divided up as follows

Sensor calibration menu:

Calibration of Zero and Span (C-ALL): By activation the display (yes /) through button a zero and span calibration is performed
After approx. 10 seconds the DMV4000 is fully functional

Calibration via Calibration point (C-Hi): By activating the display (yes /) through the button a calibration function of the display is performed. **After approx. 10 seconds the DMV4000 is fully functional.**



9. Additional function:

Peak hold:

During normal operation of the DMV 4000 the internal peak hold can be evaluated and deleted. The highest and lowest point of the pressure range this function allows pressure spikes to be registered. After switching on the unit this function is constantly repeated.

Push  button: The minimum value is displayed for five seconds

Push  button: The maximum value is displayed for five seconds

Push  button: all values are deleted and re-set to the original set-point
Measurement resumes until next point of deletion or until the unit is switched on and off again

Display of measuring values

During normal operation of the instrument the possibility of allowing the measuring value to be displayed in time intervals is performed by repeatedly pushing the button 

Following display and adjustment possibilities are possible

Lo = Min-value of the pressure range 

Hi = Max-value of the pressure range 

Unit = Display of the selected measuring value  

AItU = De- / activation of Interval display of the measuring value, during normal operation (YES / no  )

Fail safe feature:

The DMV 4000 has a fail-safe feature for the connected pressure sensor. The following signals are monitored: Signal + pin 8 signal - pin 9, supply voltage + pin 11, Supply voltage – pin 13.
On breakdown of one of the above mentioned signals, or by not connected pressure sensor, the fail safe feature is displayed with "OPEn" . Additionally all alarm signals are activated. An analogue signal will then give out a minimal output.

10. Error reading:

Display:	Reason:	Error elimination:
"OPEn"	Sensor defect, connector cable defect Sensor incorrectly connected	Sensor, connector cable and Sensor connection to be checked
" 88888 "	Overflow – Value too small to be displayed.	
" 88888 "	Overflow – Value too large to be displayed	

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
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